

AMENDMENTS TO THE CLAIMS:

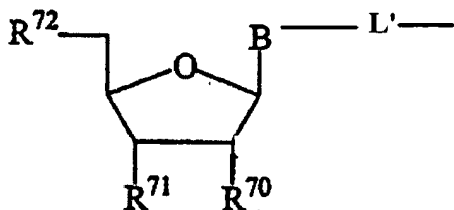
This listing of claims will replace all prior versions, and listings, of claims in the application.

LISTING OF CLAIMS:

Claims 1- 69 (canceled)

Claim 70 (currently amended): A labeled nucleoside/tide or nucleoside/tide analog comprising a rhodamine dye conjugated by a linker (L') to a nucleoside/tide or nucleoside/tide analog (NUC), wherein:

the rhodamine is a rhodamine-type parent xanthene having attached to the xanthene C9 carbon a phenyl group that is further substituted with an ortho carboxy or ortho sulfonate group or a salt thereof, one to three substituted or unsubstituted aminopyridinium groups and a substituted or unsubstituted alkylthio[.,] or arylthio group; and the nucleoside/tide or nucleoside/tide analog and linker taken together comprise the structure:



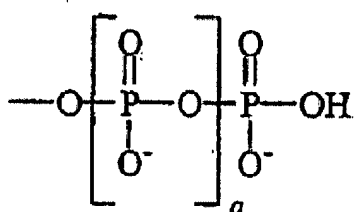
wherein:

B is a nucleobase selected from a purine, a 7-deazapurine, an 8-aza,7-deazapurine, a pyrimidine, a normal nucleobase and a common analog of a normal nucleobase;

L' is the linker;

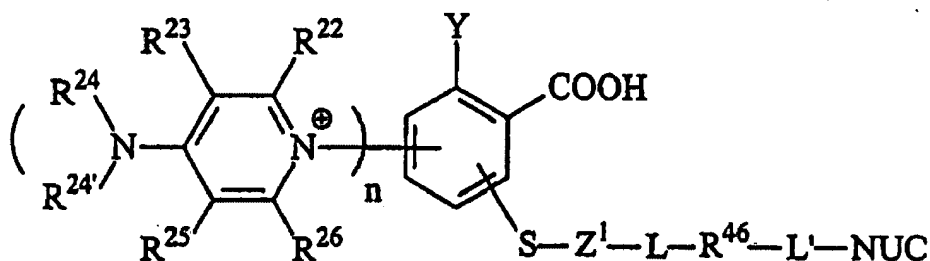
R^{70} and R^{71} , when taken alone, are each independently selected from hydrogen, hydroxyl and a moiety which blocks polymerase-mediated template-directed polymerization, or when taken together form a bond such that the illustrated sugar is 2',3'-didehydroribose; and

R^{72} is selected from hydroxyl, a phosphate ester having the formula:



where a is an integer from 0 to 2, and a phosphate ester analog, or a salt thereof.

Claim 71 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of claim 70 comprising the formula:



wherein:

Y is a rhodamine-type parent xanthene ring attached to the illustrated phenyl group at the xanthene C9 carbon;

R^{22} , R^{23} , R^{25} , and R^{26} are independently selected from hydrogen and (C₁-C₆) alkyl;

R^{24} , when taken alone, is (C₁-C₆) alkyl, or when taken together with $R^{24'}$ is (C₄-

C₁₀) alkylidiyl, (C₄-C₆) alkyleno, (C₄-C₆) heteroalkylidiyl and (C₄-C₆) heteroalkyleno;

R^{24'}, when taken alone, is (C₁-C₆) alkyl, or when taken together with R²⁴ is (C₄-C₁₀) alkylidiyl, (C₄-C₆) alkyleno, (C₄-C₆) heteroalkylidiyl and (C₄-C₆) heteroalkyleno;

n is 1, 2, or 3;

S is sulfur;

Z¹ is selected from (C₁-C₁₂) alkylidiyl, (C₁-C₁₂) alkylidiyl independently substituted with one or more of the same or different W¹ groups, (C₅-C₁₄) arylidiyl, and (C₅-C₁₄) arylidiyl independently substituted with one or more of the same or different W² groups;

W¹ is selected from -X, -R, =O, -OR, -SR, =S, -NRR, =NR, -CX₃, -CN, -OCN, -SCN, -NCO, -NCS, -NO, -NO₂, =N₂, -N₃, -S(O)₂O⁻, -S(O)₂OH, -S(O)₂R, -C(O)R, -C(O)X, -C(S)R, -C(S)X, -C(O)OR, -C(O)O⁻, -C(S)OR, -C(O)SR, -C(S)SR, -C(O)NRR, -C(S)NRR AND -C(NR)NRR;

W² is selected from -R, -OR, -SR, -NRR, -S(O)₂O⁻, -S(O)₂OH, -S(O)₂R, -C(O)R, -C(O)X, -C(S)R, -C(S)X, -C(O)OR, -C(O)O⁻, -C(S)OR, -C(O)SR, -C(S)SR, -C(O)NRR, -C(S)NRR and -C(NR)NRR;

L is selected from a bond, (C₁-C₁₂) alkylidiyl, (C₁-C₁₂) substituted alkylidiyl, (C₆-C₂₆) arylalkylidiyl, -O-, -S-, -NR-, -C(O)O-, -C(O)NR-, -NRS(O)₂-, -NR-NR-, -NRC(O)O-, and -NRC(O)NR-;

R⁴⁶ is selected from -C(O)NR-, -C(O)O-, and -C(O)S-,

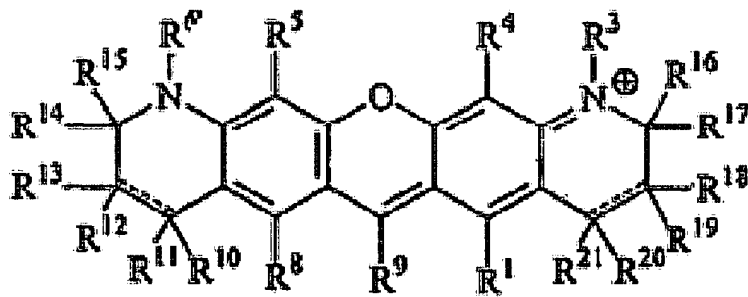
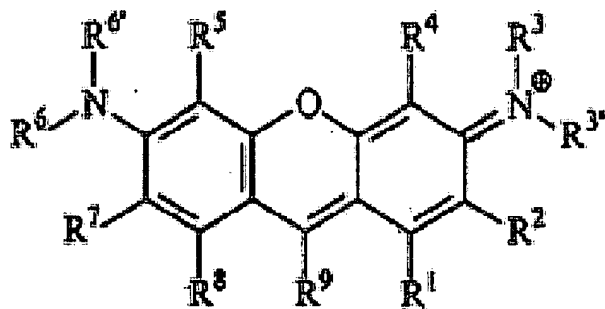
L' is selected from (C₁-C₂₀) alkylidiyl, (C₁-C₂₀) heteroalkylidiyl, (C₁-C₂₀) alkyleno, (C₁-C₂₀) heteroalkyleno, (C₆-C₂₆) arylalkylidiyl, (C₅-C₂₀) heteroarylalkylidiyl, and substituted forms thereof; and

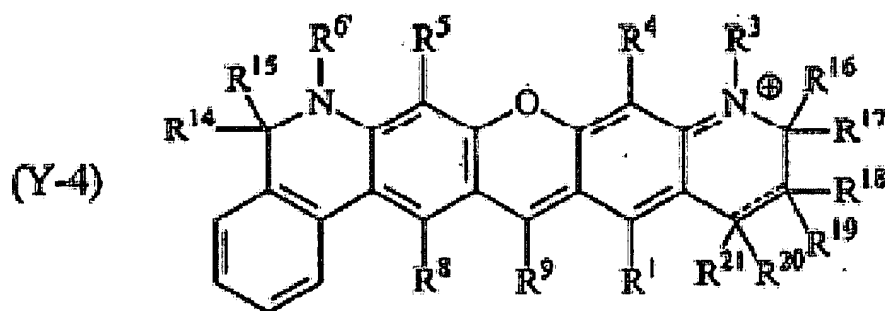
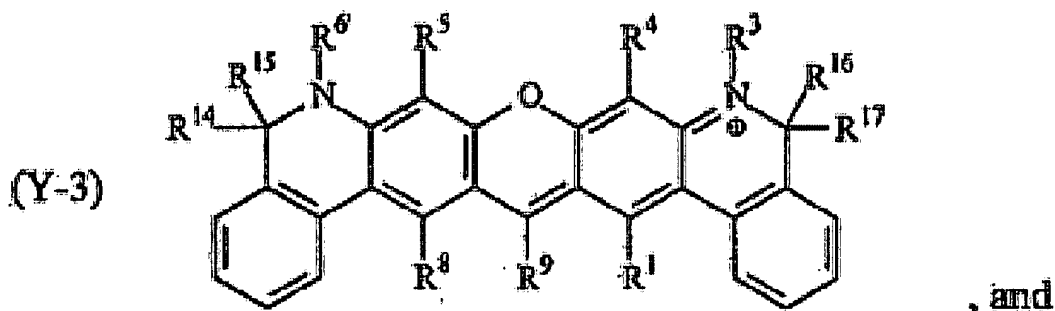
NUC is a nucleoside/tide or nucleoside/tide analog;

each R is independently selected from hydrogen, (C₁-C₆) alkyl, (C₅-C₂₀) aryl, (C₆-C₂₆) arylalkyl, and (C₅-C₂₀) arylaryl; or when two R groups on the same nitrogen atom are taken together, those two R groups are (C₄-C₁₀) alkylidiyl or (C₄-C₁₀) alkyleno; and

each X is independently a halogen.

of claim 71 wherein Y comprises the rhodamine-type parent xanthene ring structures:





and a salt thereof, wherein:

R^1 and R^2 when taken alone, are independently hydrogen or (C₁-C₆) alkyl;

R^3 and $R^{3'}$ when taken alone, are independently selected from hydrogen, (C₁-C₆) alkyl, (C₅-C₁₄) aryl and (C₅-C₁₄) arylaryl, or when taken together is (C₄-C₆) alkylidyl or (C₄-C₆) alkyleno, or when individually taken together with R^2 or R^4 is (C₂-C₆) alkylidyl or (C₂-C₆) alkyleno;

R^4 , when taken alone, is selected from hydrogen and (C₁-C₆) alkyl, or when taken together with R^3 or $R^{3'}$ is (C₂-C₆) alkylidyl or (C₂-C₆) alkyleno;

R^5 , when taken alone, is selected from hydrogen and (C₁-C₆) alkyl, or when taken together with R^6 or $R^{6'}$ is (C₂-C₆) alkylidyl or (C₂-C₆) alkyleno;

R^6 and $R^{6'}$ when taken alone, are selected from hydrogen, (C₁-C₆) alkyl, (C₅-C₁₄) aryl and arylaryl, or when taken together are (C₄-C₆) alkylidyl or alkyleno, or when individually taken together with R^5 or R^7 is (C₂-C₆) alkylidyl or alkyleno;

R^7 , when taken alone, is selected from hydrogen and (C₁-C₆) alkyl, or when taken together with R^6 or $R^{6'}$ is (C₂-C₆) alkylidyl or alkyleno;

R^8 , when taken alone, is selected from hydrogen and (C₁-C₆) alkyl;

R^{10} , R^{11} , R^{12} , R^{13} , R^{14} , R^{15} , R^{16} , R^{17} , R^{18} , R^{19} , R^{20} and R^{21} are each independently selected from hydrogen and (C₁-C₆) alkyl, or

when R^{10} , R^{11} , R^{12} and R^{13} taken together are (C₅-C₁₄) aryleno or (C₅-C₁₄) aryleno substituted with one or more of the same or different (C₁-C₆) alkyl, or

when R^{18} , R^{19} , R^{20} and R^{21} taken together are (C₅-C₁₄) aryleno or aryleno substituted with one or more of the same or different (C₁-C₆) alkyl; and

R^9 is the point of attachment to the xanthene C9 carbon.

Claim 73 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of claim 72 wherein R^2 when taken together with R^3 or $R^{3'}$ is (C₂-C₆) alkylidyl or (C₂-C₆) alkyleno.

Claim 74 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of claim 72 wherein:

an alkylidyl or alkyleno bridge formed by taking R^2 together with R^3 or $R^{3'}$, R^7 together with R^6 or $R^{6'}$, or R^4 together with R^3 or $R^{3'}$, is ethano, propano, 1,1-dimethylethano, 1,1-dimethylpropano or 1,1,3-trimethylpropano;

an aryleno bridge formed by taking R^1 together with R^2 is benzo or naphtho;

an alkylidyl or alkyleno bridge formed by taking R^3 together with $R^{3'}$, or R^6 together with $R^{6'}$, is butano;

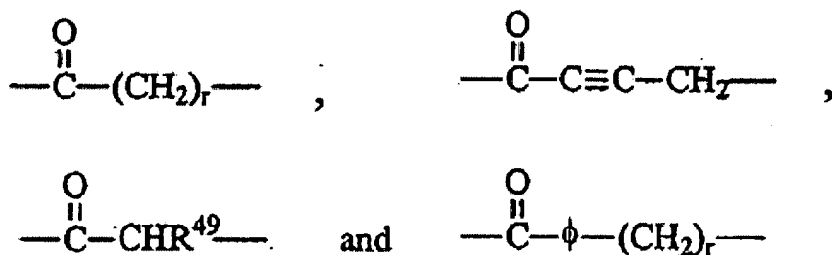
an alkylidyl or alkyleno bridge formed by taking R^5 together with R^6 or $R^{6'}$; is ethano, propano, 1,1-dimethylethano, 1,1-dimethylpropano and 1,1,3-trimethylpropano; and

an aryleno bridge formed by taking R^{10} , R^{11} , R^{12} and R^{13} together, or R^{18} , R^{19} , R^{20} and R^{21} together, is benzo.

Claim 75 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of claim 71 in which Z¹ is phenyldiyl.

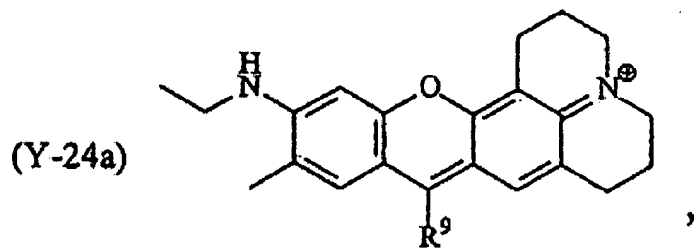
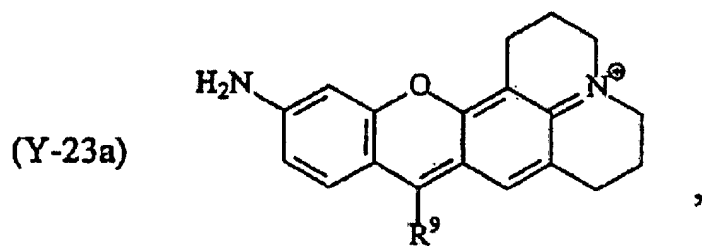
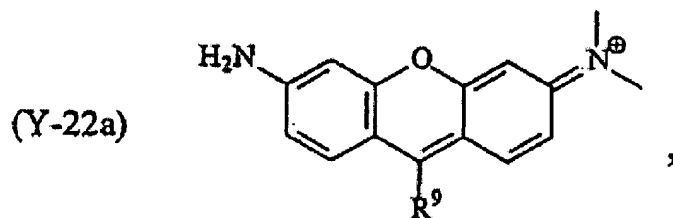
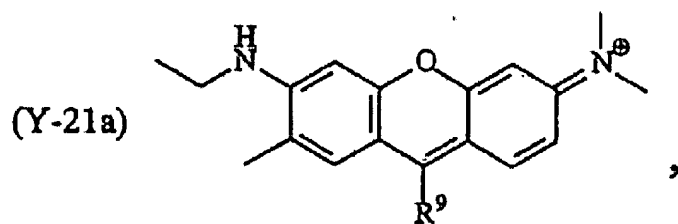
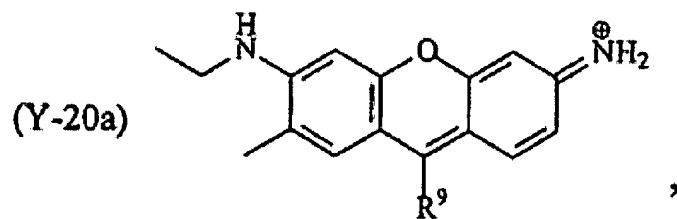
Claim 76 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of Claim 71 in which L' is selected from: $\text{—C}\equiv\text{C—CH}_2\text{—}$ and $\text{—C}\equiv\text{C—CH}_2\text{—O—CH}_2\text{CH}_2\text{—}$.

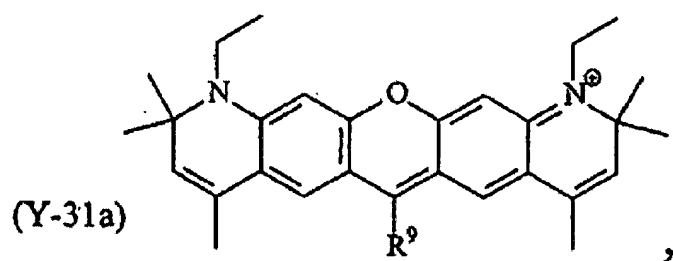
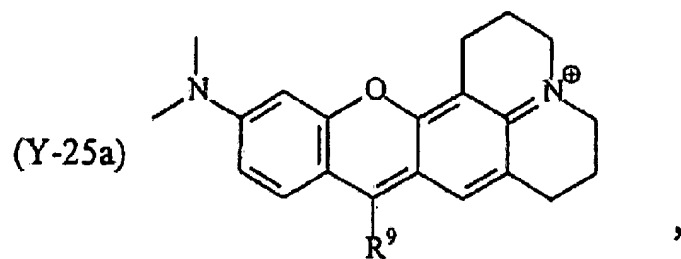
Claim 77 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of Claim 71 in which L' is: $\text{—C}\equiv\text{C—CH}_2\text{—O—CH}_2\text{CH}_2\text{—N}(\text{R}^{47})\text{—R}^{48}\text{—}$ wherein R⁴⁷ is hydrogen or (C₁-C₆) alkyl, and R⁴⁸ is selected from:

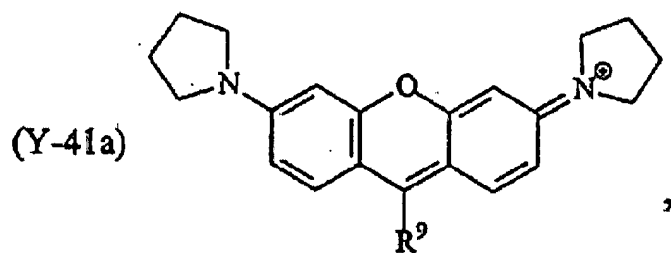
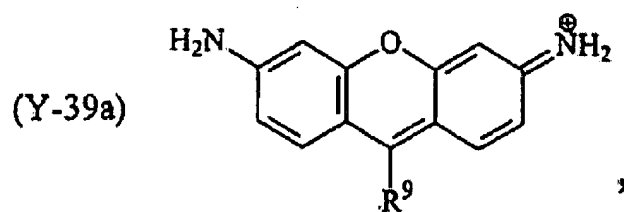
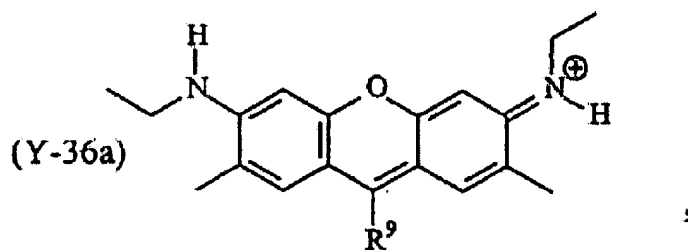
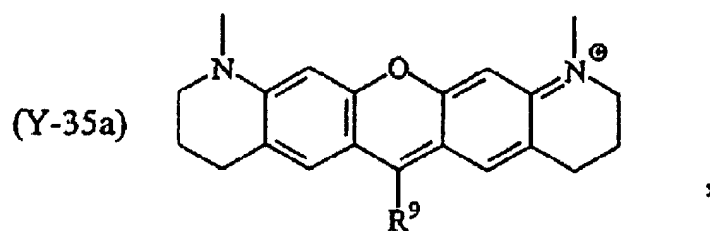
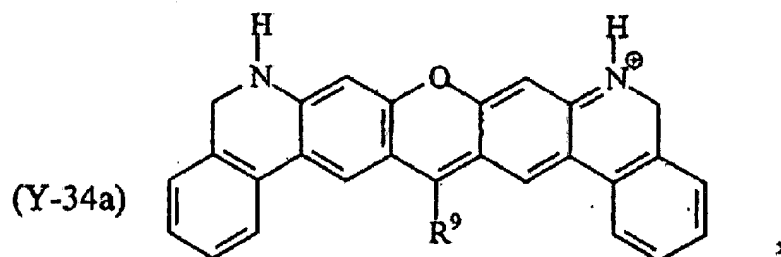


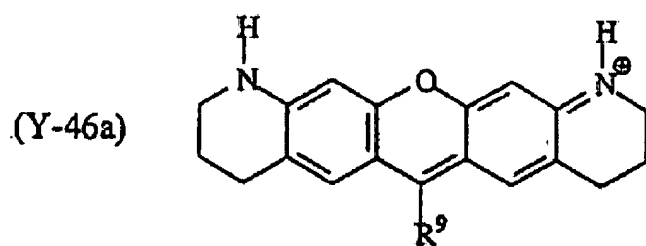
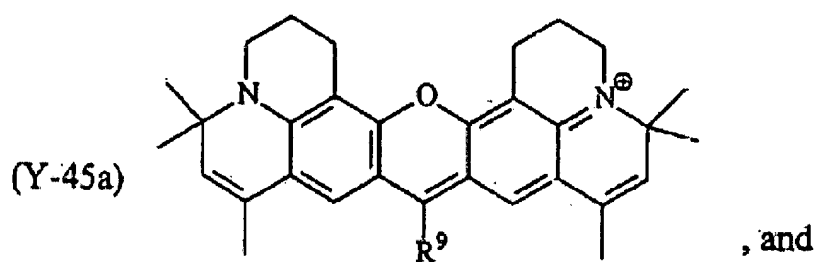
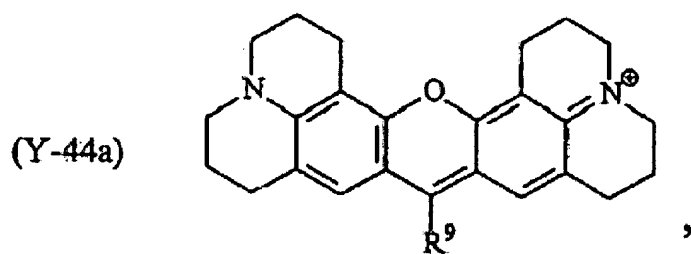
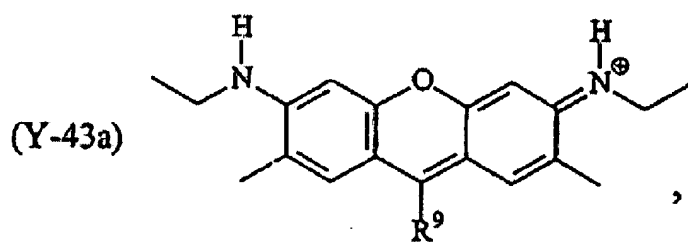
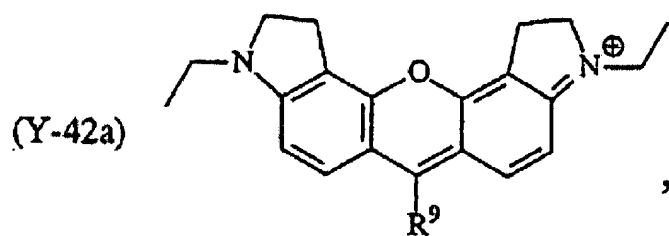
wherein each r is independently an integer from 1 to 6; R⁴⁹ is hydrogen, (C₁-C₆) alkyl, or an amino acid side chain; and ϕ is phenyldiyl or substituted phenyldiyl.

Claim 78 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of claim 71 in which Y is selected from the structures:



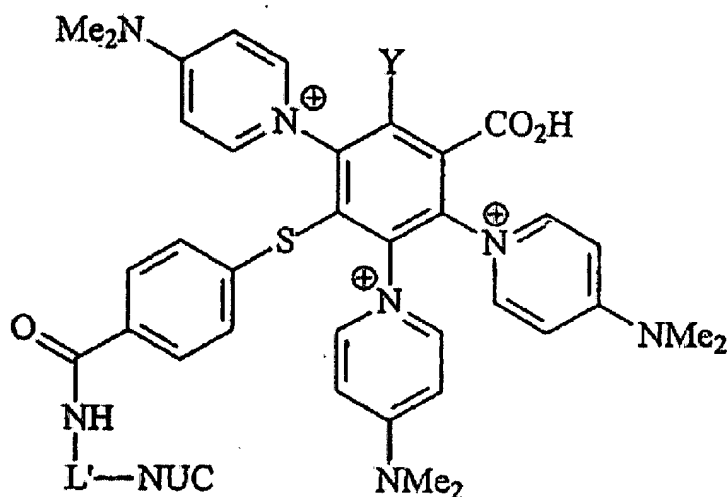






Claim 79 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of claim 71 wherein R^{22} , R^{23} , R^{25} , and R^{26} are each hydrogen.

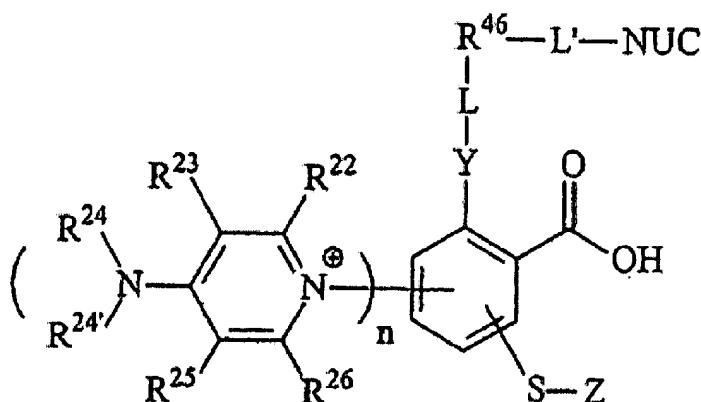
Claim 80 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of claim 71 which comprises the structure:



or a salt thereof.

Claim 81 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of Claim 80 in which L' is selected from: $—C\equiv C—CH_2—$ and $—C\equiv C—CH_2—O—CH_2CH_2—$.

Claim 82 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of claim 70 comprising the formula:



wherein:

Y is a rhodamine-type parent xanthene ring attached to the illustrated phenyl group at the xanthene C9 carbon;

R^{22} , R^{23} , R^{25} , and R^{26} are independently selected from hydrogen and (C₁-C₆) alkyl;

R^{24} , when taken alone, is (C₁-C₆) alkyl, or when taken together with $R^{24'}$ is (C₄-C₁₀) alkyldiyl, (C₄-C₆) alkyleno, (C₄-C₆) heteroalkyldiyl or (C₄-C₆) heteroalkyleno;

$R^{24'}$, when taken alone, is (C₁-C₆) alkyl, or when taken together with R^{24} is (C₄-C₁₀) alkyldiyl, (C₄-C₆) alkyleno, (C₄-C₆) heteroalkyldiyl or (C₄-C₆) heteroalkyleno;

n is 1, 2, or 3;

S is sulfur;

Z is (C₁-C₁₂) alkyl, (C₁-C₁₂) alkyl substituted with one or more of the same or different W¹ groups, (C₅-C₂₀) aryl, and (C₅-C₂₀) aryl substituted with one or more of the same or different W² groups;

W¹ is selected from -X, -R, =O, -OR, -SR, =S, -NRR, =NR, -CX₃, -CN, -OCN, -SCN, -NCO, -NCS, -NO, -NO₂, =N₂, -N₃, -S(O)₂O⁻, -S(O)₂OH, -S(O)₂R, -C(O)R, -C(O)X, -C(S)R, -C(S)X, -C(O)OR, -C(O)O⁻, -C(S)OR, -C(O)SR, -C(S)SR, -C(O)NRR, -C(S)NRR and -C(NR)NRR;

W^2 is selected from $-R$, $-OR$, $-SR$, $-NRR$, $-S(O)_2O^-$, $-S(O)_2OH$, $-S(O)_2R$, $-C(O)R$, $-C(O)X$, $-C(S)R$, $-C(S)X$, $-C(O)OR$, $-C(O)O^-$, $-C(S)OR$, $-C(O)SR$, $-C(S)SR$, $-C(O)NRR$, $-C(S)NRR$ and $-C(NR)NRR$;

L is selected from a bond, (C_1-C_{12}) alkylidiyl, (C_1-C_{12}) substituted alkylidiyl, (C_6-C_{26}) arylalkylidiyl, $-O-$, $-S-$, $-NR-$, $-C(O)O-$, $-C(O)NR-$, $-NRS(O)_2-$, $-NR-NR-$, $-NRC(O)O-$, and $-NRC(O)NR-$;

R^{46} is selected from $-C(O)NR-$, $-C(O)O-$, and $-C(O)S$,

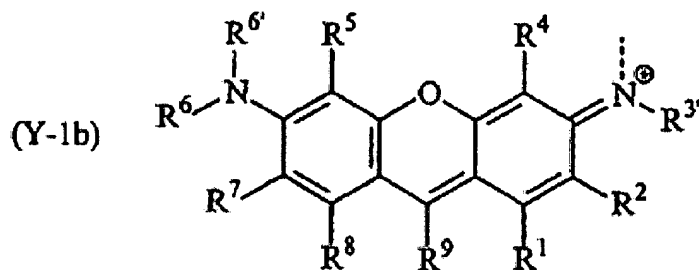
L' is selected from (C_1-C_{20}) alkylidiyl, (C_1-C_{20}) heteroalkylidiyl, (C_1-C_{20}) alkyleno, (C_1-C_{20}) heteroalkyleno, (C_6-C_{26}) arylalkylidiyl, (C_5-C_{20}) heteroarylalkylidiyl, and substituted forms thereof; and

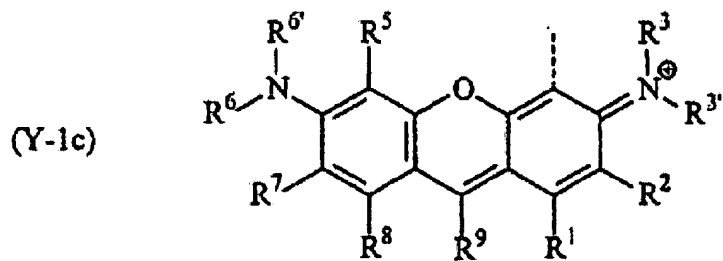
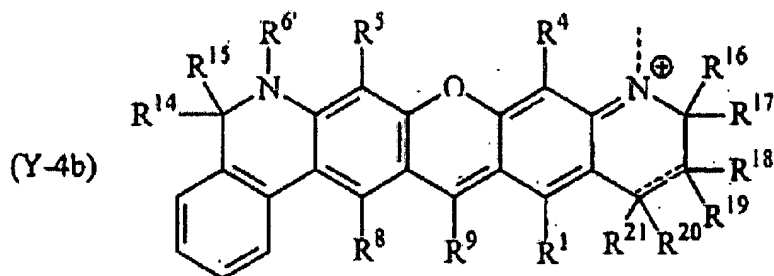
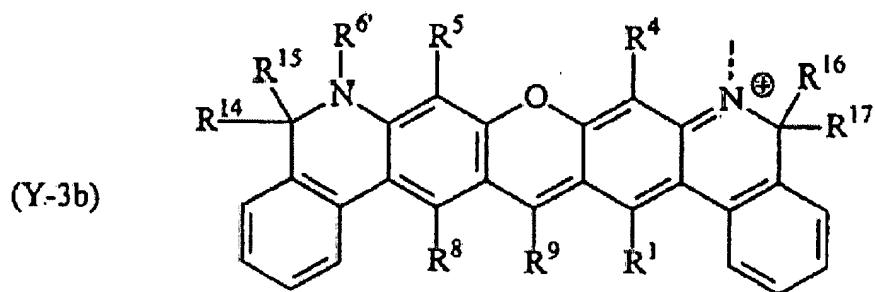
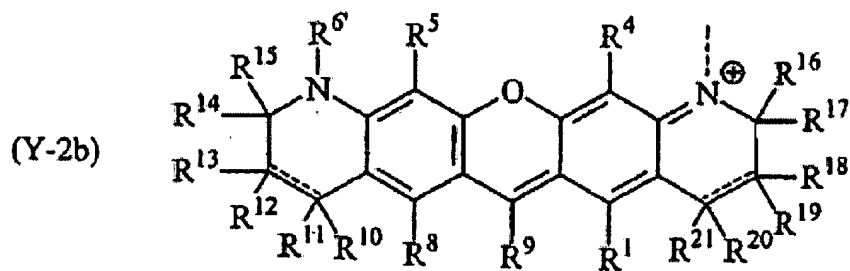
NUC is a nucleoside/tide or nucleoside/tide analog;

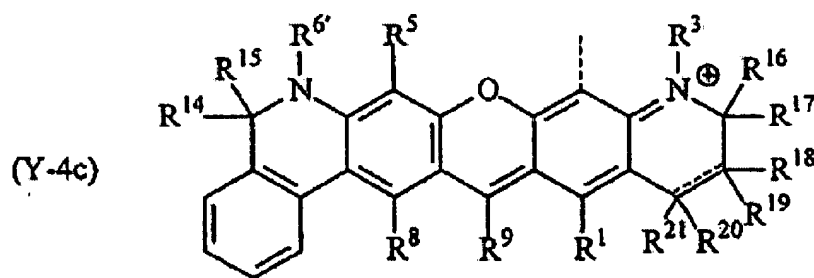
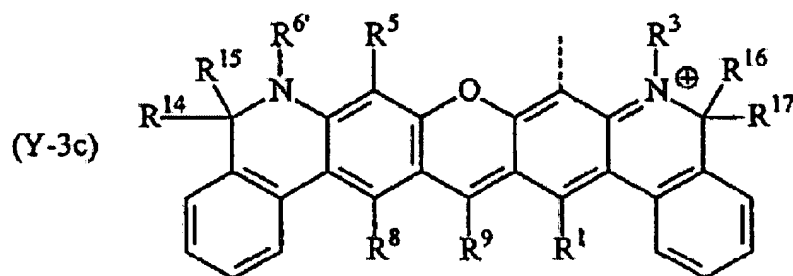
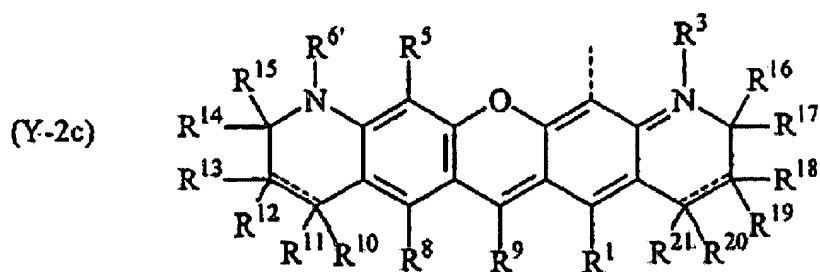
each R is independently selected from hydrogen, (C_1-C_6) alkyl, (C_5-C_{20}) aryl, (C_6-C_{20}) arylalkyl, and (C_6-C_{20}) arylaryl; or when two R groups on the same nitrogen atom are taken together, those two R groups are (C_4-C_{10}) alkylidiyl or (C_4-C_{10}) alkyleno; and

each X is independently a halogen.

Claim 83 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of Claim 82 in which Y is selected from:







wherein the dashed line at the nitrogen or C4 atom indicates the point of attachment of L.

Claim 84 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of claim 82 wherein:

an alkylidyl or alkylene bridge formed by taking R^2 together with R^3 , R^4 together with R^3 , R^5 together with R^6 , or R^7 together with R^6 , is ethano, propano, 1,1-dimethylethano, 1,1-dimethylpropano or 1,1,3-trimethylpropano; and

an aryleno bridge formed by taking R^{10} , R^{11} , R^{12} and R^{13} together or R^{18} , R^{19} , R^{20} and R^{21} together is benzo.

Claim 85 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of claim 82 in which L is selected from phenyldiyl and naphthyldiyl.

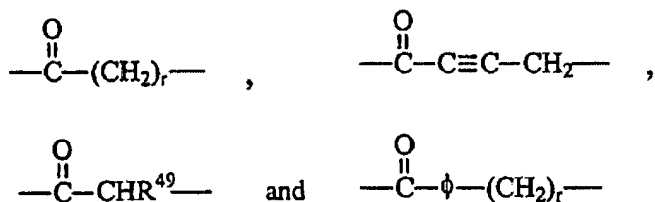
Claim 86 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of claim 82 in which L is $-(CH_2)_i-\phi-$ where i is an integer from 1 to 6 and ϕ is phenyldiyl or naphthyldiyl.

Claim 87 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of claim 82 in which Z is selected from phenyl, benzyl, naphthyl, pyridyl and purinyl.

Claim 88 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of Claim 82 in which L' is selected from: $—C\equiv C-CH_2—$ and $—C\equiv C-CH_2-O-CH_2CH_2—$.

Claim 89 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog

of Claim 82 in which L' is: $—C\equiv C-CH_2-O-CH_2CH_2-N(R^{47})-R^{48}—$ wherein R^{47} is hydrogen or (C_1-C_5) alkyl, and R^{48} is selected from:

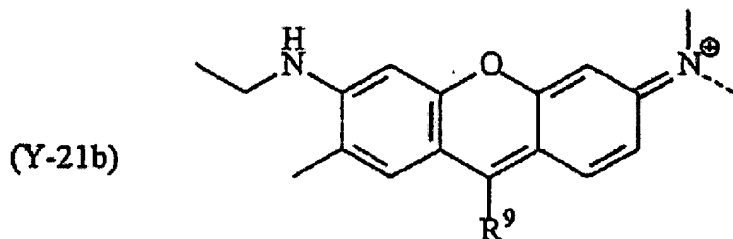
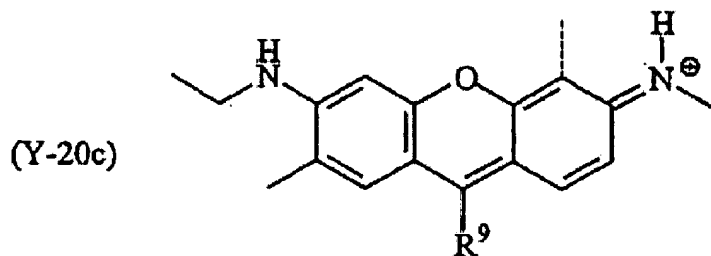
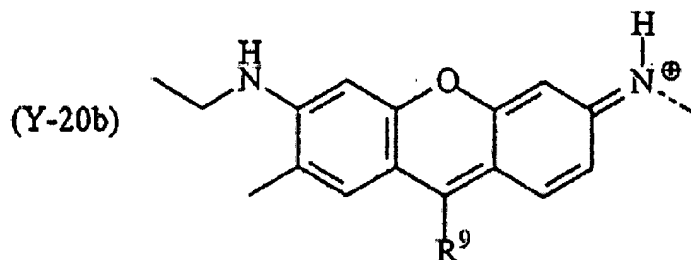


wherein each r is independently an integer from 1 to 6, R^{49} is hydrogen, (C_1-C_6) alkyl, or

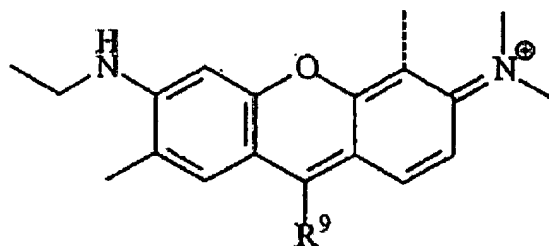
an amino acid side chain; and ϕ is phenyldiyl or substituted phenyldiyl.

Claim 90 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of claim 82 wherein R^{22} , R^{23} , R^{25} , and R^{26} are each hydrogen.

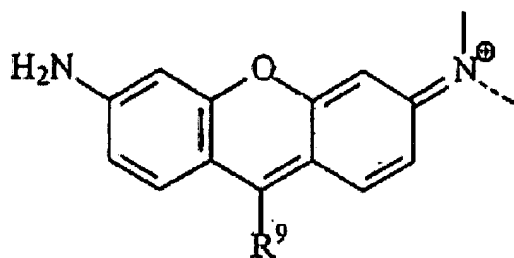
Claim 91 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of claim 82 in which Y is selected from the group consisting of:



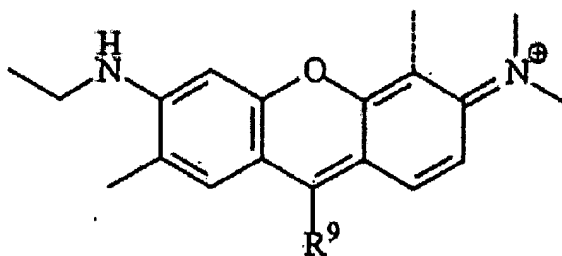
(Y-21c)



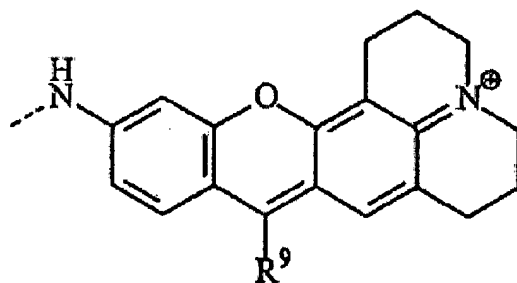
(Y-22b)

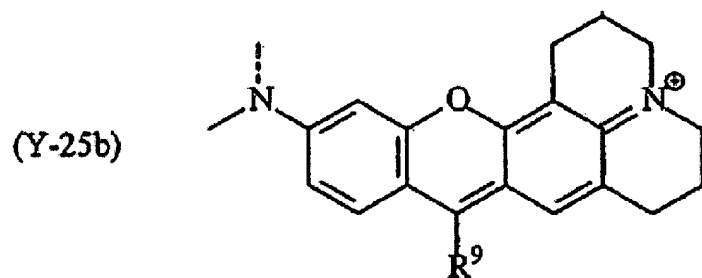
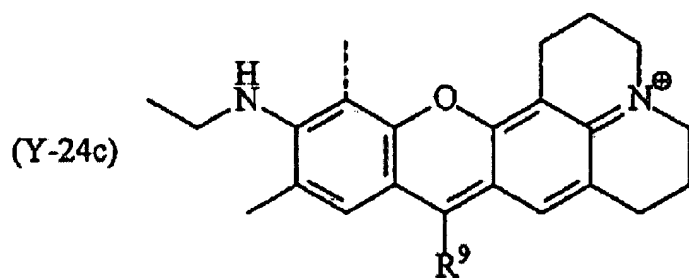
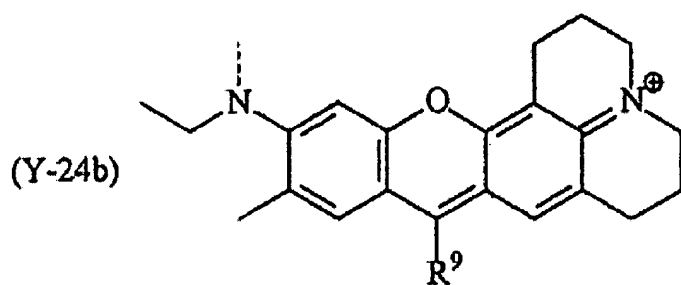
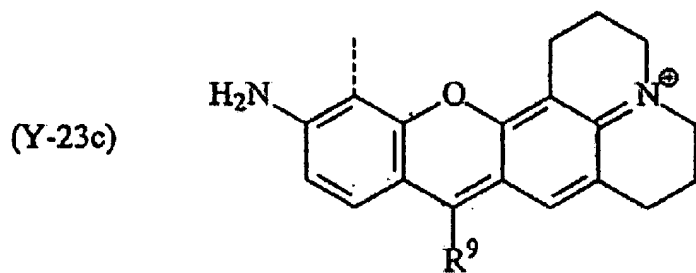


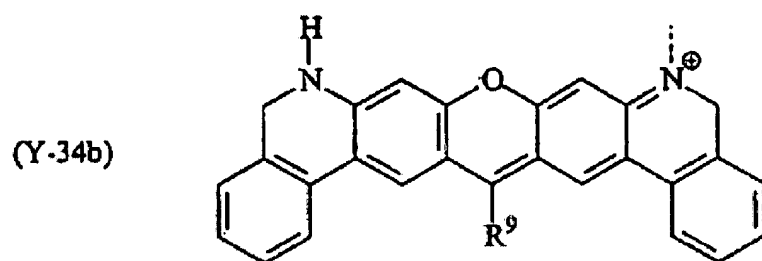
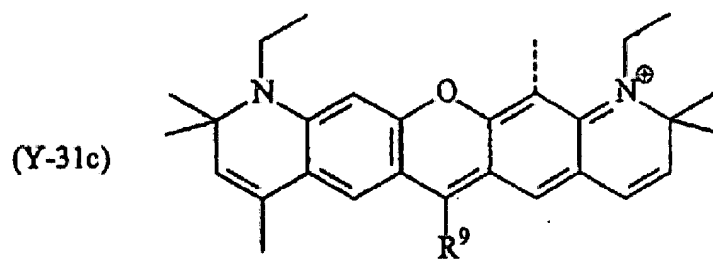
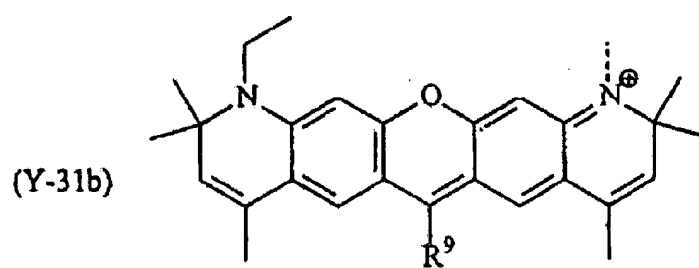
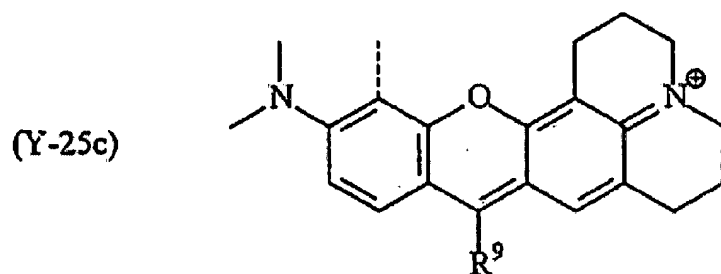
(Y-22c)

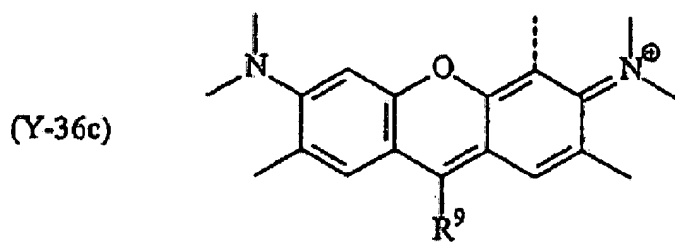
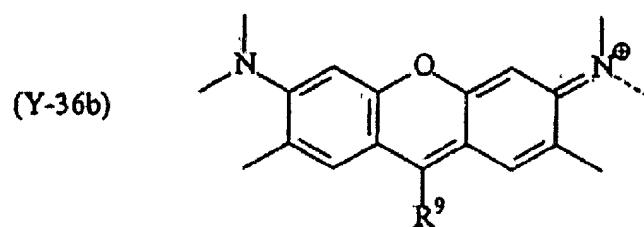
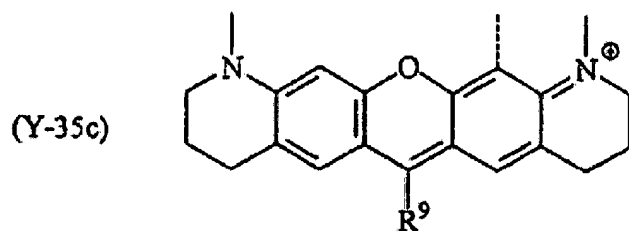
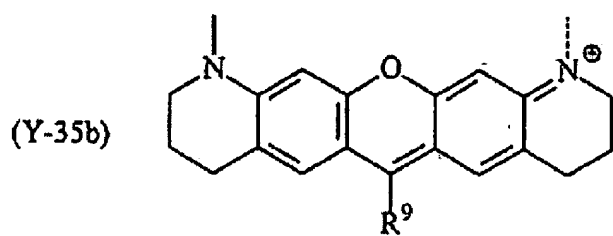
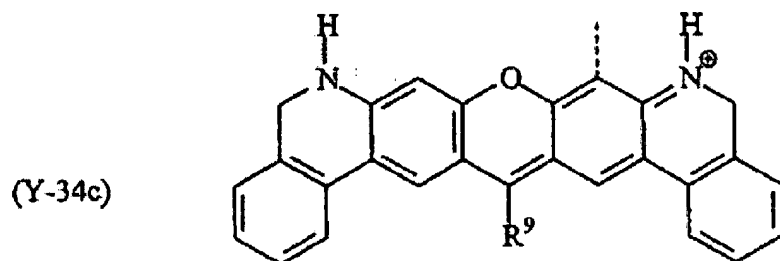


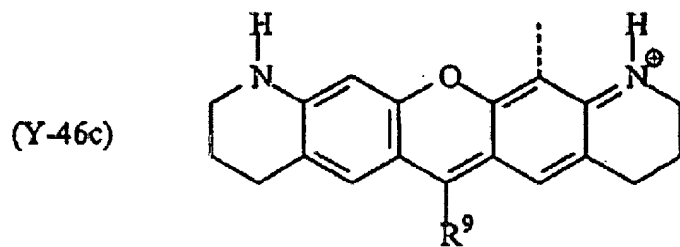
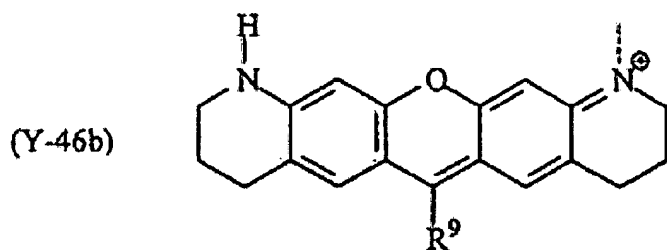
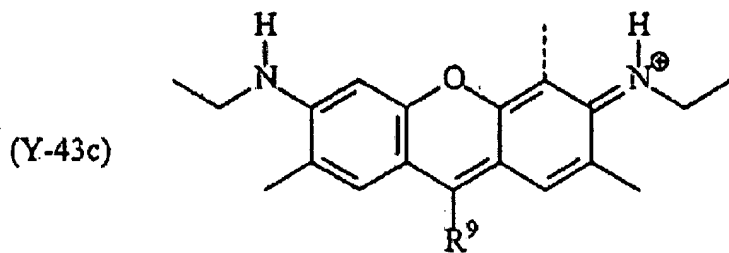
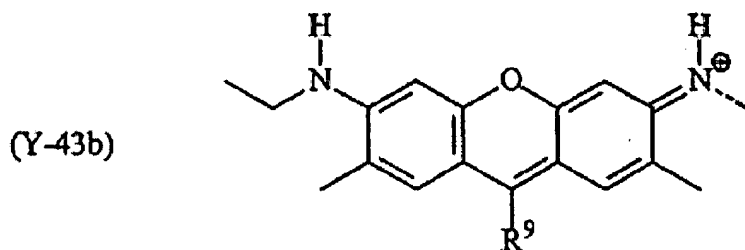
(Y-23b)





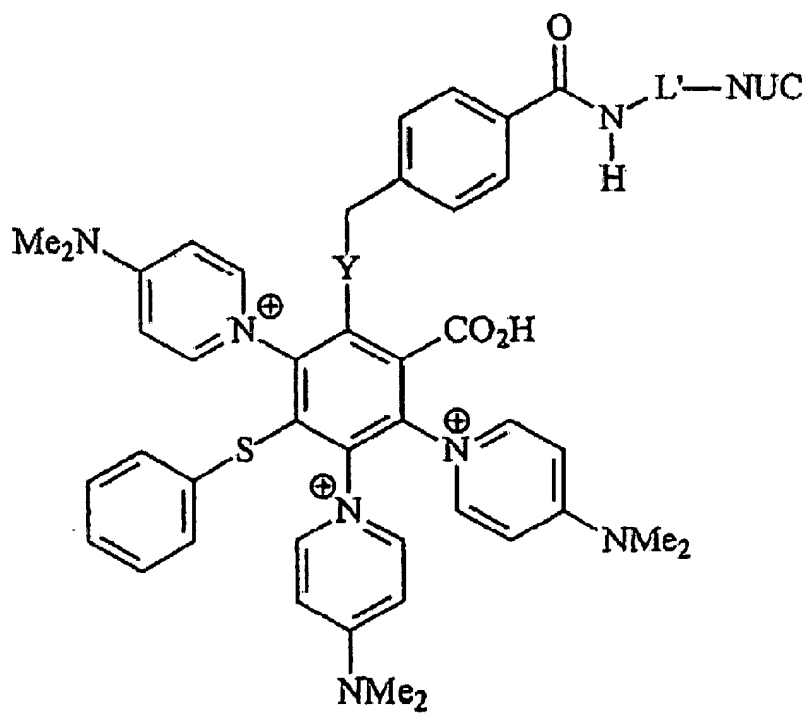






wherein the dash at the nitrogen or C4 atom indicates the point of attachment of L.

Claim 92 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of Claim 82 which has the structure:



Claim 93 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of Claim 92 in which L' is selected from: $\text{—C}\equiv\text{C—CH}_2\text{—}$ and $\text{—C}\equiv\text{C—CH}_2\text{—O—CH}_2\text{CH}_2\text{—}$.

Claim 94 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of Claim 70 further comprising a donor dye or an acceptor dye whereby the rhodamine dye and the donor dye or acceptor dye form an energy-transfer dye pair.

Claim 95 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of Claim 94 wherein the donor dye or acceptor dye is a fluorescein, rhodamine, cyanine, phthalocyanine or squaraine.

Claim 96 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog

of Claim 94 wherein the donor dye or acceptor dye is 4'-aminomethyl-6-carboxyfluorescein and the 4'-aminomethyl-6-carboxyfluorescein is covalently attached to the rhodamine dye by a linker.

Claim 97 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of Claim 96 wherein the aminomethylfluorescein is further covalently attached by a linker L' to the nucleobase B of the nucleoside/tide or nucleoside/tide analog.

Claim 98 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of Claim 70 which is enzymatically incorporatable.

Claim 99 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of Claim 70 which is a terminator.

Claim 100 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of Claim 70 which is enzymatically extendable.

Claim 101 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of Claim 70 wherein R⁷¹ and R⁷⁰ are hydrogen.

Claim 102 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of Claim 70 wherein R⁷¹ and R⁷⁰ are hydroxyl.

Claim 103 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of Claim 70 wherein R⁷¹ is hydroxyl, and R⁷⁰ is hydrogen.

Claim 104 (previously presented): The labeled nucleoside/tide or nucleoside/tide analog of Claim 70 in which nucleobase B is selected from adenine, 7-deazaadenine, cytosine, guanine, 7-deazaguanine, thymine and uracil.

Claim 105 (currently amended): A labeled polynucleotide or polynucleotide analog comprising a rhodamine dye conjugated to a nucleoside/tide or nucleoside/tide analog, wherein the rhodamine is a rhodamine-type parent xanthene having attached to the xanthene C9 carbon a phenyl group that is further substituted with an ortho carboxy or ortho sulfonate group or a salt thereof, one to three substituted or unsubstituted aminopyridinium groups and a substituted or unsubstituted alkylthio[,] or arylthio group.